

Amendments to the Claims:

The listing of claims will replace all versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-36 (canceled)

Claim 37 (original): A purified composition, wherein the purified composition comprises a chondroitin polymer made by a recombinant process.

Claim 38 (original): A purified composition, wherein the purified composition comprises a chondroitin polymer made by a chondroitin synthase.

Claim 39 (original): A purified composition, wherein the purified composition comprises a chondroitin polymer made by a *Pasteurella multocida* chondroitin synthase.

Claim 40 (original): A purified composition, wherein the purified composition comprises a chondroitin polymer made by the *Pasteurella multocida* chondroitin synthase of SEQ ID NO:2 or 4.

Claim 41 (original): A purified composition, wherein the purified composition comprises a chondroitin polymer made by the *Pasteurella multocida* chondroitin synthase comprising the nucleotide sequence in accordance with SEQ ID NO:1 or 3.

Claim 42 (currently amended): The purified composition of claims 37, 38, 39, 40, and 41, ~~and 42~~, wherein the chondroitin polymer is represented by a structure, (Beta-1,4-GlcUA-beta-1,3-GalNAc)_n wherein n is a positive integer greater than or equal to 1 and the chondroitin polymer is unsulfated.

Claim 43 (currently amended): ~~A~~ The purified composition of claim 42, wherein the purified composition comprises a chondroitin polymer having a modified size distribution.

Claim 44 (currently amended): ~~A~~ The purified composition of claim 42, wherein the purified composition comprises a chondroitin polymer having a modified structure.

Claims 45-96 (canceled)

Claim 97 (withdrawn): A dermatan polymer obtained by the process of epimerizing a chondroitin polymer, wherein the chondroitin polymer is produced by a chondroitin synthase.

Claim 98 (withdrawn): The dermatan polymer of claim 97, wherein the chondroitin synthase is a *Pasteurella multocida* chondroitin synthase.

Claim 99 (withdrawn): The dermatan polymer of claim 98, wherein the *Pasteurella multocida* chondroitin synthase is in accordance with SEQ ID NO:2 or 4.

Claim 100 (withdrawn): A recombinantly produced unsulfated chondroitin polysaccharide.

Claim 101 (withdrawn): The recombinantly produced unsulfated chondroitin polysaccharide of claim 100 produced by a chondroitin synthase.

Claim 102 (withdrawn): The recombinantly produced unsulfated chondroitin polysaccharide of claim 101, wherein the chondroitin synthase is in accordance with SEQ ID NO:2 or 4.

Claim 103 (withdrawn): A polysaccharide comprising alternating Beta 1,4-linked [**GalNAc**] **GlcUA** and Beta 1,3-linked [**GlcUA**] **GalNAc** in a 1:1 ratio of the polysaccharide, the polysaccharide further having the properties: (1) nature: a white amorphous powder; (2) solubility: insoluble in alcohol, acetone, chloroform, and soluble in water and dimethylsulfoxide; (3) component sugars: glucuronic acid and N-acetyl-galactosamine only; (4) molecular weight: 1,000 - 250,000; (5) H-NMR spectrum: exhibiting signals characteristic of unsulfated chondroitin; (6) enzymatic sensitivity: susceptible to chondroitinase ABC, but not hyaluronate lyase; and (7) color reaction: positive to phenol-sulfuric acid reaction and carbazole reaction.

Claim 104 (withdrawn): The polysaccharide of claim 103, wherein the polysaccharide is extracted and isolated from a culture media in which a microorganism belonging to the class *Pasteurella* is cultured.

Claim 105 (withdrawn): The polysaccharide of claim 104, where the culture media is selected from the group consisting of tissue, yeast or milk extracts or a chemically defined media composed of vitamins, amino acids and salts, or combinations thereof.

Claim 106 (withdrawn): The polysaccharide of claim 105, wherein the polysaccharide is purified from the culture media by a method selected from the group consisting of solvent precipitation, aliphatic quaternary amine precipitation, ion exchange chromatography, selective extraction, or selective ultrafiltration/dialysis, and combinations thereof.

Claims 107-109 (canceled)

Claims 110 (withdrawn): The polysaccharide of claim 106, wherein the polysaccharide is modified by a treatment selected from the group consisting of sulfation, epimerization, fragmentation, or cross-linking and combinations thereof.

Claim 111 (currently amended): ~~A~~ An unsulfated chondroitin polymer produced *in vitro* by the method comprising the steps of:

- providing a chondroitin synthase;
- placing the chondroitin synthase in a ~~medium~~ reaction mixture suitable for the ~~expression~~ production of a ~~a~~ an unsulfated chondroitin polymer; and
- extracting the unsulfated chondroitin polymer out of the medium.

Claim 112 (currently amended): The unsulfated chondroitin polymer of claim 111, wherein in the step of providing a chondroitin synthase, the chondroitin synthase is from *Pasteurella multocida*.

Claim 113 (currently amended): The unsulfated chondroitin polymer of claim 112, wherein in the step of providing a chondroitin synthase, the chondroitin synthase is from *Pasteurella multocida* and has an amino acid sequence as set forth in SEQ ID NO:2 or 4.

Claim 114 (currently amended): The unsulfated chondroitin polymer of claim 112, wherein in the step of providing a chondroitin synthase, the chondroitin synthase from *Pasteurella multocida* is a nucleotide sequence as set forth in SEQ ID NO:1 or 3.

Claim 115 (currently amended): ~~A~~ An unsulfated chondroitin polymer produced *in vivo* by the method comprising the steps of:

- providing a chondroitin synthase gene;
- placing the chondroitin synthase gene in a native or recombinant organism, thereby providing a native or recombinant organism having a chondroitin synthase therein;
- placing the native or recombinant organism having a

- chondroitin synthase therein in a medium suitable for the expression of a an unsulfated chondroitin polymer; and
- extracting the unsulfated chondroitin polymer.

Claim 116 (currently amended): The unsulfated chondroitin polymer of claim 115, wherein in the step of providing a chondroitin synthase, the chondroitin synthase is from *Pasteurella multocida*.

Claim 117 (currently amended): The unsulfated chondroitin polymer of claim 116, wherein in the step of providing a chondroitin synthase, the chondroitin synthase gene is from *Pasteurella multocida* and has an amino acid sequence as set forth in SEQ ID NO:2 or 4.

Claim 118 (currently amended): The unsulfated chondroitin polymer of claim 116, wherein in the step of providing a chondroitin synthase, the chondroitin synthase from *Pasteurella multocida* is a nucleotide sequence as set forth in SEQ ID NO:1 or 3.

Claim 119 (currently amended): A An unsulfated chondroitin polymer, produced by the method comprising the steps of:

- introducing a purified nucleic acid segment having a coding

region encoding enzymatically active chondroitin synthase into a host organism, wherein the host organism contains nucleic acid segments encoding enzymes which produce UDP-GlcUA and UDP-GalNAc;

- growing the host organism in a medium to secrete an unsulfated chondroitin polymer; and
- recovering the secreted unsulfated chondroitin polymer.

Claim 120 (currently amended): The unsulfated chondroitin polymer of claim 119, wherein in the step of recovering the unsulfated chondroitin polymer, the unsulfated chondroitin polymer is extracted from the medium or the cells or combinations thereof.

Claim 121 (currently amended): The unsulfated chondroitin polymer of claim 120, further comprising the steps of purifying the extracted unsulfated chondroitin polymer.

Claim 122 (currently amended): The unsulfated chondroitin polymer of claim 119, further comprising the step of sulfating the chondroitin polymer.

Claim 123 (currently amended): The unsulfated chondroitin polymer of claim 119, further comprising the step of epimerizing the chondroitin polymer.

Claim 124 (currently amended): The unsulfated chondroitin polymer of claim 119, wherein in the step of growing the host organism, the host organism secretes a structurally modified unsulfated chondroitin polymer.

Claim 125 (currently amended): The unsulfated chondroitin polymer of claim 119, wherein in the step of growing the host organism, the host organism secretes a an unsulfated chondroitin polymer having a modified size.

Claim 126 (withdrawn): A heterologous polypeptide produced in a host cell by the recombinant method comprising the steps of:

- (a) transforming the host cell with a vector comprising a promoter and a nucleic acid construct comprising a nucleic acid sequence encoding a desired heterologous polypeptide, wherein said promoter comprises a transcriptional activating region of the nucleic acid sequence set forth in SEQ ID NO:1 or 3, and wherein the nucleic acid construct is positioned in operable linkage with the promoter;
- (b) culturing the transformed host cell of step (a); and

- (c) recovering the heterologous polypeptide from the transformed host cell of step (b).

Claim 127 (currently amended): A An unsulfated chondroitin polymer produced by a process of fermentation of a cell expressing a chondroitin synthase enzyme having an amino acid sequence in accordance with SEQ ID NO:2 or 4.

Claim 128 (previously presented): A chondroitin polymer produced by a process for the *in vitro* sulfation of a chondroitin polymer, wherein the chondroitin polymer is produced by a chondroitin synthase and the chondroitin polymer is sulfated by either chemical or enzymatic means.

Claim 129 (previously presented): The chondroitin polymer of claim 128, wherein the chondroitin synthase is a *Pasteurella multocida* chondroitin synthase.

Claim 130 (previously presented): The chondroitin polymer of claim 129, wherein the *Pasteurella multocida* chondroitin synthase is as set forth in SEQ ID NO:2 or 4.